

### **REMARKS**

This is intended as a full and complete response to the Office Action dated April 18, 2007, having a shortened statutory period for response set to expire on July 18, 2007. In view of the following amendment and discussion, the Applicants believe all claims are in allowable form.

### **CLAIM REJECTIONS**

#### **A. 35 U.S.C. §112 Claims 7-14**

Claims 7-14 stand rejected under 35 U.S.C.112, second paragraph. In response, the Applicants have amended claim 7 by adding the term "of substrate surface" after the term "sccm/cm<sup>2</sup>". The support for this amendment is provided in Paragraph 17, Lines 3-5 of the specification. Accordingly, the Applicants submit that the claims 7-14 are in allowable form and respectfully request the rejection withdrawn.

#### **B. 35 U.S.C. §102 Claims 15-20**

Claims 15-20 stand rejected under 35 U.S.C. §102(e) as being anticipated by United States Patent Publication No. 2003/0194495 published October 16, 2003 to *Li, et al.* (hereinafter referred to as "*Li*"). In response, the Applicants have cancelled claims 15-20 without prejudice to expedite allowance of the remaining claims. The Applicants reserve the right to further prosecute the cancelled subject matter in continuing applications.

#### **C. 35 U.S.C. §103 Claims 1-5**

Claims 1-5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Li* in view of United States Patent No. 6,211,096 published April 3, 2001 to *Allman, et al.* (hereinafter referred to as "*Allman*"). The Applicants respectfully disagree.

Independent claim 1 recites elements not taught or suggested by the combination of *Li* and *Allman*. *Li* teaches using a cyclic organosilicon compound and at least one aliphatic organosilicon to react with an oxidizing gas to deposit a low-k dielectric constant film. The oxidizing gas may be O<sub>2</sub> or N<sub>2</sub>O gas. However, *Li* does not

teach or suggest using both O<sub>2</sub> or N<sub>2</sub>O gas, and consequently, does teach or suggest that a ratio of O<sub>2</sub> or N<sub>2</sub>O gas should be in any particular range. Thus, *Li* does not teach or suggest delivering a gas mixture comprising two or more oxidizing gases comprising N<sub>2</sub>O and O<sub>2</sub> to a substrate in a chamber, wherein a ratio of a flow rate of the N<sub>2</sub>O to a total flow rate of the two or more oxidizing gases into the chamber is between about 0.1 and about 0.5, as recited by claim 1.

*Allman* teaches depositing a dielectric film with tunable dielectric constant by adding different sources during depositing. The example of the deposition cited by the Examiner is used to deposit a high dielectric constant film. (Col. 6, Lines 14-16 and 55-60; Col. 7, Lines 5-10 of *Allman*). *Allman* teaches using a TEOS based gas precursor while *Li* teaches using a cyclic organosilicon precursor, and as such, the chemical reactions taught by *Allman* and *Li* are different and produce different types of deposited films. One skilled in the art would see *Allman* as providing a teaching or suggestion not bridge the gap between *Li* and the claimed invention, specifically that both O<sub>2</sub> or N<sub>2</sub>O gas should be utilized, and that the O<sub>2</sub> or N<sub>2</sub>O gases are provided in at a specific ratio.

Thus, one skilled in the art would not perceive a teaching or suggestion from *Allman* to utilize process attributes used for depositing *Allman*'s high dielectric constant film in a process for depositing a low dielectric constant film as taught by *Li*. Specifically, one skilled in the art would not perceive a teaching or suggestion from the high dielectric constant film deposition process of *Allman* to modify a low dielectric constant film as taught by *Li* in a manner that would yield delivering a gas mixture comprising two or more oxidizing gases comprising N<sub>2</sub>O and O<sub>2</sub> to a substrate in a chamber, wherein a ratio of a flow rate of the N<sub>2</sub>O to a total flow rate of the two or more oxidizing gases into the chamber is between about 0.1 and about 0.5, as recited by claim 1. Therefore, there is no teaching or suggestion from *Allman* that would suggest to one of ordinary skill in the art to modify *Li* in a manner that would yield delivering a gas mixture comprising two or more oxidizing gases comprising N<sub>2</sub>O and O<sub>2</sub> to a substrate in a chamber, wherein a ratio of a flow rate of the N<sub>2</sub>O to a total flow rate of the two or more oxidizing gases into the chamber is between about 0.1 and about 0.5, as recited by claim 1. As such, a *prima facie* case of obviousness has not been established as the references fail to teach each claimed element.

Thus, Applicant submits that independent claim 1 and all claims depending therefrom are patentable over *Li* in view of *Allman*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

**D. 35 U.S.C. §103 Claims 7-13**

Claims 7-13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Li*. In response, the Applicants have amended claim 7 to more clearly recite certain aspects of the invention.

Independent claim 7 recites elements not taught or suggested by *Li*. *Li* teaches using a cyclic organosilicon compound and an aliphatic organosilicon to react with an oxidizing gas to deposit a low-k dielectric constant film. The oxidizing gas may be O<sub>2</sub> or N<sub>2</sub>O gas. However, *Li* does not teach or suggest delivering a gas mixture consisting essentially of a cyclic organosiloxane, and an oxidizing gas comprising N<sub>2</sub>O to a substrate in a chamber, wherein the N<sub>2</sub>O is delivered into the chamber at a flow rate between about 0.71 sccm/cm<sup>2</sup> and about 1.42 sccm/cm<sup>2</sup> to the substrate surface, as recited by claim 7.

Thus, Applicant submits that independent claim 7 and all claims depending therefrom are patentable over *Li*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

**DOUBLE PATENTING**

Claims 15-20 stand rejected under the obviousness-type double patenting as being unpatentable over claims 1, 9 and 13-14 of United States Patent No. 6,797,643. In response, the Applicants have cancelled claims 15-20 to expedite the examination process. The Applicants reserve the right to further prosecute the cancelled subject matter in continuing applications.

Claims 1-5 stand rejected under the obviousness-type double patenting as being unpatentable over claims 1, 9 and 13-14 of United States Patent No. 6,797,643 in view of *Allman*. Claim 6 stands rejected under the obviousness-type double patenting as being unpatentable over claims 1, 9 and 13-14 of United States Patent No. 6,797,643 in view of *Allman* and in view of *Ross*. Claims 7-13 stand rejected under the obviousness-

type double patenting as being unpatentable over claims 1, 9 and 13-14 of United States Patent No. 6,797,643 in view of *Li*. In response, the Applicants agree to file a Terminal Disclaimer under 37 C.F.R. §1.130(b) to obviate the rejection once the rejections to the claims under 35 U.S.C. §§ 102, 103 and 112 have been withdrawn.

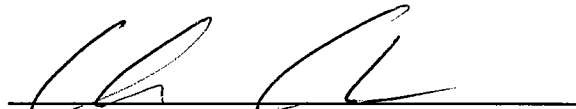
**CONCLUSION**

Thus, for at least the reasons discussed above, Applicants submit that all claims are in condition for allowance. Accordingly, the Applicants respectfully request reconsideration of this application and its early allowance.

If the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Mr. Keith Taboada at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

July 18, 2007



KEITH TABOADA  
Attorney Reg. No. 45,150  
(732) 530-9404

Patterson & Sheridan, LLP  
595 Shrewsbury Avenue  
Suite 100  
Shrewsbury, NJ 07702